

Claims

- [c1] 1. A method of bonding a heat sink to a chip package structure, wherein the chip package structure at least comprises a chip and a stiffener ring around the chip with the stiffener ring set up over a substrate, and the heat sink comprises a first protruding section located at a position corresponding to the chip and a plurality of second protruding sections located at positions corresponding to the stiffener ring, the method comprising the steps of:
- forming a gluing layer over the first protruding section and the second protruding sections of the heat sink; and bonding the heat sink to the chip package structure such that the first protruding section of the heat sink is attached to the chip and the second protruding sections of the heat sink are attached to the stiffener ring.
- [c2] 2. The method of claim 1, wherein the process of forming a gluing layer over both the first protruding section and the second protruding sections comprising the steps:
- providing a gluing tape, wherein the gluing tape comprises a cutting pattern with a shape that matches with

the first protruding section and the second protruding sections of the heat sink;
aligning the first protruding section and the second protruding section of the heat sink with the cutting pattern and disposing the heat sink onto the gluing tape; and detaching the heat sink from the gluing tape so that a portion of the gluing tape remains adhered to the first and the second protruding sections to form the gluing layer.

- [c3] 3. The method of claim 2, wherein the gluing tape comprises a heat-softening double-sided adhesive tape.
- [c4] 4. The method of claim 2, wherein the gluing tape comprises a partially polymerized B-stage adhesive film.
- [c5] 5. The method of claim 1, wherein a material constituting the heat sink comprises copper.
- [c6] 6. The method of claim 1, wherein the first protruding section and the second protruding sections are formed together with the heat sink into an integral unit.
- [c7] 7. The method of claim 1, wherein the sum area of all the second protruding sections is less than the area of the stiffener ring.
- [c8] 8. The method of claim 1, wherein the step of bonding

the heat sink to the chip package structure further comprises performing a curing operation.

- [c9] 9. A heat sink for bonding to a chip package structure, wherein the chip package structure at least comprises a chip and a stiffener ring around the chip with the chip and the stiffener ring set on a substrate, comprising:
 - a planar section;
 - a first protruding section on one of the surfaces of the planar section, wherein the first protruding section is formed in a location that corresponds with the chip; and
 - a plurality of second protruding sections on the same surface of the planar section for the first protruding section, wherein the second protruding sections are formed in locations that correspond with the stiffener ring.
- [c10] 10. The heat sink of claim 9, wherein a material constituting the heat sink comprises copper.
- [c11] 11. The heat sink of claim 9, wherein the first protruding section and the second protruding sections are formed together with the heat sink as an integral unit.
- [c12] 12. The heat sink of claim 9, wherein the sum area of all the second protruding sections is less than the area of the stiffener ring.
- [c13] 13. A chip package structure, comprising:

a substrate;
a chip set on the substrate, wherein the chip is electrically connected to the substrate;
a stiffener ring set on the substrate, wherein the stiffener ring surrounds the chip;
a heat sink having a first protruding section and a plurality of second protruding sections, wherein the first protruding section is attached to the chip and the second protruding sections are attached to the stiffener ring;
and
a gluing layer disposed between the first protruding section and the chip and between the second protruding sections and the stiffener ring.

- [c14] 14. The chip package structure of claim 13, wherein a material constituting the heat sink comprises copper.
- [c15] 15. The chip package structure of claim 13, wherein the first protruding section and the second protruding sections are formed together with the heat sink into an integral unit.
- [c16] 16. The chip package structure of claim 13, wherein the sum area of all the second protruding sections is less than the area of the stiffener ring.
- [c17] 17. The chip package structure of claim 13, wherein the

gluing tape comprises a heat-softening double-sided adhesive tape.

[c18] 18. The chip package structure of claim 13, wherein the gluing tape comprises a partially polymerized B-stage adhesive film.

[c19] 19. The chip package structure of claim 13, wherein the chip is connected to the substrate through a plurality of bumps.

[c20] 20. The chip package structure of claim 13, wherein the space between the chip and the substrate is filled with an underfill material.